

Appl. No. 10/693,584

Reply to Final Office Action of March 31, 2006

**REMARKS****Application Amendments**

Claims 1-33 are present in the application. Claim 7, 8 are cancelled. Claims 18-33 are currently withdrawn, but in some instances amended in anticipation of rejoinder.

Claim 1 is amended to define the bridging group Y via a Markush group. The elements of this Markush group for Y are those set forth in original Claims 14 and 16 which thus provide support for this Claim 1 amendment. Claim 1 is also amended to specify that there are two abstractable ligands X associated with M. Support for this amendment to Claim 1 is found in original Claim 2.

Claim 2 is amended to convert it into an independent claim which defines the abstractable ligand X elements of the structural formula in terms of a Markush group. Support for recitation of the elements in this Claim 2 Markush group is found in original Claims 7 and 8.

Claims 9, 10 and 11 are amended to depend from Claim 2 and to delete the halogen and alkoxide elements from the Markush groups used to define the two X substituents.

Claim 12 is amended to delete "osmium" from the Markush group used to define the "M" element of the formula.

Withdrawn Claims 21, 22, 26 to 33 are also similarly amended in anticipation of rejoinder.

No additional claim fees are due as a result of these amendments.

Appl. No. 10/693,584

Reply to Final Office Action of March 31, 2006

**Invention Synopsis**

The present invention, as described in the amended claims presented herein, is directed to an organometal complex useful as a catalyst precursor. Such a catalyst precursor comprises a selected Group-8, -9, or -10 transition metal, M; an ancillary bi-dentate ligand associated with M and comprising a substituted terminal amine and a substituted terminal phosphine connected by a hydrocarbyl bridge Y; and two abstractable ligands, X, also associated with the metal M in addition to the P-N containing ancillary ligand.

**Restriction Requirement**

Claims 18-33 had been previously withdrawn pursuant to the Restriction Requirement set forth in the November 15, 2005 Office Action. Applicant believes claims 1 to 17 to be allowable and requests rejoinder of claims 18 to 33 under MPEP § 821.04. Claims 18 to 33, as amended herein, would now all depend from an allowable base claim or contain all limitations in an allowable base claim as required under MPEP § 821.04. Rejoinder of claims 18 to 33 is accordingly requested.

**Formal Matters**

Claim 12 has been finally rejected under 35 USC §112, Second Paragraph, as being indefinite for failing to further limit Claim 1 from which it depended. By the amendments presented herein, Claim 12 has been rewritten to depend from new independent Claim 2 and has been rewritten to remove "osmium" from the recited Markush group of metals. It is submitted that such a Claim 12 amendment makes clear that Claim 12 does further limit the scope of the claim from which it depends. This amendment would thus obviate the rejection of Claim 12 under 35 USC §112, Second Paragraph.

Claims 16 and 17 have also been finally rejected under 35 USC §112, Second Paragraph, as being indefinite in extending beyond the scope of Claim 1 from which it depended. The

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Appl. No. 10/693,584  
Reply to Final Office Action of March 31, 2006

Examiner urges that Claims 16 and 17 include Y groups which can contain elements other than carbon and hydrogen and that the scope of these claims thus extends beyond the "hydrocarbyl" characterization of the Y groups in Claim 1. This Section 112 rejection is respectfully traversed.

Paragraphs 0007 and 0008 in the published version (U.S. 2004/0138056) of this application indicate that, for purposes of this invention, the term "hydrocarbyl" can include "substituted hydrocarbyl" and that the substituents on the hydrocarbyl radicals can include elements other than carbon and hydrogen. Given this definition for "hydrocarbyl," it is submitted that the Y group definitions in Claims 16 and 17 are not inconsistent with or beyond the scope of the term "hydrocarbyl" as used in the new independent Claim 2 (from which Claims 16 and 17 now depend). In short, Claims 16 and 17 are in complete compliance with the definiteness requirement of 35 USC §112, Second Paragraph.

#### **Rejections under 35 USC § 102**

Claims 1-10 and 12-13 have been finally rejected under 35 USC §102(b) as allegedly being anticipated by Sumi et al (U.S. Patent No. 6,323,353, hereinafter "Sumi"). The Examiner maintains his position that the selected identified portions of Sumi and especially the materials disclosed in Column 17 of Sumi represent a disclosure of the metal complexes described by applicants' claims. Such a rejection is respectfully traversed as it would apply to the claims as they are amended herein.

With respect to amended Claim 1, this claim now defines the Y bridging group of the applicants' claimed catalyst precursors in terms of a Markush group which does not encompass bi-naphthyl Y moieties. The Sumi ligands, on the other hand, must utilize a bi-naphthyl moiety as the bridge between the amino and phosphino groups in the aminophosphine compounds disclosed therein. Accordingly, Sumi cannot directly anticipate amended Claim 1 of the present application because none of the Y moieties of amended Claim 1 are disclosed in Sumi.

Appl. No. 10/693,584  
Reply to Final Office Action of March 31, 2006

The composition of matter of Claims 2-6 and 9-17, as amended herein, is represented by the structural formula set forth in amended Claim 2. That structural formula has two abstractable X ligand groups associated with the metal M (in addition to the bi-dentate P-N ligand). These two X ligands would also be characterized by a Markush group which includes a number of types of organic moieties but does not include halogen or alkoxy groups. It is submitted that none of the metal complex starting materials, or the metal complexes themselves, shown in Column 17 of Sumi would provide or conform to complexes of the type now encompassed by the scope of Claims 2-6 and 9-17 as amended herein. This is because such complexes of the present invention must have two abstractable X ligands, each of which must be one of the X groups listed in the amended claims. Sumi, on the other hand, discloses no such complexes wherein both of the X substituents within the metal complex would meet the definition of amended Claims 2-6 and 9-17.

Given the foregoing considerations, it is submitted that entry of the claim amendments presented herein would serve to obviate the Section 102 rejection of amended Claims 1-6, 9-10, 12 and 13 over the Sumi reference. Continued rejection of such amended claims as being directly anticipated by Sumi would therefore be improper.

Claims 1-17 have also been finally rejected under 35 USC §102(b) as allegedly being anticipated by Buchwald et al (U.S. Patent No. 6,307,087, hereinafter "Buchwald"). The Examiner maintains his position that the selected identified portions of Buchwald and especially the metal-ligand complexes disclosed in Column 32 of Buchwald represent materials which can be used to form metal complexes of the type encompassed in applicant's claims. Such a rejection is also respectfully traversed as it would apply to the claims as they would be amended herein.

The specific palladium and nickel complexes disclosed in Column 32 of Buchwald are not complexes which contain a bi-dentate aminophosphine ancillary ligand. (And applicants' claims exclude the Buchwald-disclosed palladium in any event.) Column 32 of Buchwald does say that bi-dentate ligands such as "hybrids of phosphine with amines" can be added as such to the Buchwald reaction mixture along with metal species to thereby form *in situ* the catalytic

Appl. No. 10/693,584

Reply to Final Office Action of March 31, 2006

complexes of interest to Buchwald. But what ligands are formed on and remain on the eventually resulting catalytic metal complexes depends entirely on what ligands are present on the metal-ligand reagent added to the reaction mixture along with the aminophosphine ligand. There is no disclosure in Buchwald of any such specific metal-ligand reagent combined with any added specific aminophosphine bi-dentate ligand which would always and inevitably result in the formation of a catalyst precursor complex of the type encompassed by the structural formula set forth in applicants' Claims 1-6, and 9-17 as amended herein.

It should further be noted that Buchwald at Column 31, lines 17-18 indicates that the active form of the transition metal catalysts of interest to Buchwald "is not well characterized." Buchwald does, however, note in Column 32, lines 1-14 that it is believed that a low oxidation state (0 or +1) for the metal is desired for the reaction which the Buchwald catalysts are to promote. It is believed that the catalyst precursor complexes of the present invention, on the other hand, with their two X ligands plus the bi-dentate ancillary ligand would have their M element in the +2 oxidation state. This further suggests that whatever complexes might be formed *in situ* by the materials and procedures disclosed by Buchwald are not the same compositions as those described in applicants' amended Claims 1-6 and 9-17.

In light of the foregoing considerations, it is respectfully submitted that there is no disclosure in Buchwald of any specific catalyst precursor complex which would fall within the scope of the catalyst precursors now defined by the structural formula of applicants' amended claims. Given this situation, it is further submitted that entry of the claim amendments presented herein would serve to obviate the Section 102 rejection of amended Claims 1-6, and 9-17 over the Buchwald reference.

#### **Provisional Obviousness-Type Double Patenting**

Claims 1-17 remain provisionally rejected for obviousness-type double patenting over Claim 27 of commonly assigned, co-pending USSN 10/692,827. Applicants respectfully disagree that Claims 1-17 are obvious over Claim 27 of USSN 10/692,827. In particular, applicants note

Appl. No. 10/693,584  
Reply to Final Office Action of March 31, 2006

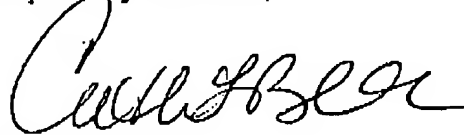
that Claim 27, as amended, is dependent on Claim 1 which requires an activator. The Examiner restricted catalyst/activator combinations in the instant application as a separate invention. Therefore applicants respectfully submit that under the Examiner's own logic, Claims 1-17 are not subject to obviousness-type double patenting over Claim 27 of USSN 10/692,827. Applicants respectfully request the rejection be withdrawn.

### CONCLUSIONS

Applicants have made an earnest effort to place their application in proper form and to establish the patentability of their claimed invention over the applied prior art. WHEREFORE, reconsideration of this application, entry of the amendments, withdrawal of the art and double patenting rejections, rejoinder of the withdrawn claims, and allowance of the amended claims herein are all respectfully requested.

Any comments or questions concerning the application can be directed to the undersigned at the telephone number given below.

Respectfully submitted,



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6-7-06

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